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AN

HISTORICAL DISCOURSE

ON OCCASION OF THE

FIFTIETH ANNIVERSARY OF THE GATHERING

OF THE

SECOND CHURCH, DORCHESTER,

DELIVERED JANUARY 3, 1858.

BY

REV. JAMES HOWARD MEANS,

Pastor of the Second Church.

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Dorchester, January 4, 1858.

TO THE REV. JAMES H. MEANS:

Dear Sir,—At a meeting of the Brethren of the Second Church in Dorchester, held this afternoon, it was voted, unanimously, that Dea. Charles Howe, and Bro. James Tucker, Jr., be a Committee to wait on the Pastor, and request for publication a copy of the Sermon preached yesterday, on the occasion of the Fiftieth Anniversary of the organization of this Church.

In conformity with the foregoing vote, we do hereby present you this request, believing that your compliance with it will be gratefully received by the members of your Church and Society.

Very respectfully and truly yours,

CHARLES HOWE, }
JAMES TUCKER, JR. } COMMITTEE.

Dorchester, January 8, 1858.

DEAR BRETHREN:

In accordance with your request, I transmit to you a copy of the Historical Discourse preached last Sabbath. It was a pleasant service for me to review the history of a Church dear to us all; and to pay a tribute, however inadequate, to one whose memory should ever be precious and honored here. May the services of this Anniversary so quicken our zeal, that the privileges we enjoy shall be preserved unimpaired for those who shall follow us.

With much esteem, your friend and Pastor,

J. H. MEANS.

Dea. CHARLES HOWE,
JAMES TUCKER, Jr., Esq.

MAILED JAN 11

RECEIVED TO

DISCOURSE.

DEUTERONOMY xxvi. 17.

THOU HAST AVOUCHED THE LORD, THIS DAY, TO BE THY GOD.

FIFTY years ago, on the 1st of January, 1808, the Rev. John Pierce, of Brookline, preached in this place from these words. With him were associated in the services of the day, the Rev. Dr. Harris of the First Church in this town, Dr. Porter and Dr. Gray of Roxbury, and Dr. Lathrop of the Second Church in Boston ; all, like himself, now numbered with the dead. Before them stood sixty-four members of the First Church, twenty-seven men and thirty-seven women, who had received a regular dismissal ; and, having renewed their covenant engagements, were declared to constitute a regularly gathered Congregational Church. Of these sixty-four, eight only are living, seven of whom remain still connected with our communion. Thus this vine was planted, we trust, by the hand

of the Lord; to this beginning must be traced whatever influence in maintaining and diffusing the truth, and saving lost souls, this church may claim.

Before reviewing the events of the half century since elapsed, it will be fitting for us, after the example of those who first united here in fellowship, to consider briefly, *the advantages of entering publicly into covenant with God.*

In some form, this has been done from the first. The sacrifices in the family of Adam, the offering of Noah after the deluge, the circumcision of the family of Abraham, the observance of the passover by the Israelites, as well as the celebration of the Christian passover by our Lord's command, were all covenant transactions, in which a promise on the part of God was recognized, and a pledge given on the part of men.

Thus, from the first, those who have believed have received special tokens and united in special services; they have been called to stand together around some altar or place of testimony, there in common to own their relations to God. The organization of bodies like this, whose formation we commemorate to-day, is, therefore, no strange or modern device; it is in accordance with a plan, ancient as the earthly kingdom of God, and appealing to principles of our nature, powerful in every age.

I. A church organization *is adapted to deepen the feeling of moral responsibility.*

The validity of God's claims does not, indeed, depend on our acknowledgment of them. Though despised, they are binding on all. The missionary may hail the Arab, coursing over the desert, or call to the proud Brahmin, and announce the immediate supremacy of Him, whose holy name they have never before heard. And though in a Christian land the Bible be scorned, and the Sabbath profaned, none the less will the sceptic be summoned to a strict account. Responsibility exists, when not confessed.

But the work is, to make it felt. How shall we impress men, so ready to throw off restraint, with a deep, abiding, energetic sense of the claims of God? The way divine wisdom appoints is this; to gather together those who feel their obligation, and, separating them from the world, to lead them to a public avouching that the Lord is their God forever. Henceforth they occupy a peculiar place. In the eyes of the world, there is a mark upon them; and in their own consciousness there must be, if they have acted sincerely, a new, ever-present weight of responsibility. They have voluntarily declared their life-long purpose to serve God; they have accepted, as their special charge, the interests of his cause on earth; he has sealed them as his representatives, his ambassadors, to hold forth the

word of life. Who have such a trust? Who occupy so responsible a position? Who bear a name so sacred? What self-searchings, self-crucifixion, what daily seeking of grace from above, are needed to meet their solemn duties. 'Let not the world have dominion over my heart'—should each one say—'let me not heed its maxims, or pant for its prizes; I am the Lord's.' 'I see ungodly men pursuing their ungodly schemes; around are deceivers, slanderers, oppressors, defrauders; oh, my soul, come not thou into their secret, lest the name thou bearest be dishonored.' 'Behold the gay and unbelieving throng; how careless, yet in what jeopardy; going down to hell, yet they, even they, may rise to heaven; by all the vows I have uttered, by all my professed experience of grace, I am constrained to hasten to their recovery. Let others pass them by, I cannot, without peculiar guilt.'

Thus do momentous obligations press on him who has covenanted with God. He may, notwithstanding all, come short; but it will be in the face of clear convictions of duty, and solemn remonstrances of conscience, and monitions from the very place of his espousals, powerfully tending to make him a faithful man.

II. A church organization *appeals to the power of sympathy.*

It promotes fidelity in Christian duty, by the

impulse that comes from association with others similarly engaged. There is no tie, unless that of the family, that binds men in so close a union. The differences of lineage, occupation, social rank, are not recognized ; in a perfect church they would be entirely forgotten ; love to Christ, the desire of holiness, the hope of heaven, emotions in which all participate, are all in all. And the fruit of this is brotherly love, a peculiarly Christian sentiment, higher than friendship, more lasting than the bond of marriage.

Many can testify of this. On the very morning on which I was writing these lines, there came to me a Christian brother who, in circumstances of much discouragement, had been from place to place, endeavoring to earn a livelihood. Allusion was made to the comfort he might derive from his hope in Christ, and his eyes filled with tears, as he said that wherever in his wanderings he met a warm-hearted Christian, there he found a friend and brother.

I need not tell you, that we were made for such sympathy, and that no human power can so shape our course and destiny, as the living contact of one we love. It is given to kings, by their royal authority, to change the actions of men ; it is given to the humblest, by the quick sympathies of piety, to do more—to change the heart. The church is intended to develop this wondrous power. Its members

are brethren ; they have one Lord, one faith, one heavenly baptism, one conflict, and one reward. Is this one exalted and filled with joy ? he becomes a witness to the rest of the power of grace. Is that one remarkably sustained in sudden affliction ? the faith of others is encouraged. Does God bless the labors of another, and make him eminently useful ? the faint-hearted, the slothful, are urged to a like activity. Does one fall into sin and a horror of darkness seize upon him ? his associates are humbled and warned. And when one goes through the dark valley, and declares that the good Shepherd is comforting him unto the end, who is there, joined with him in faith, who is not nerved to await, with better courage, his own dissolution ?

Our union is not by an outward bond ; it is by the fellowship of the heart. Many who would fall, being alone, are thus sustained ; and graces that would lie undeveloped, like seeds amid arctic frosts, spring into vigorous life in this warmer atmosphere of love. The most efficient Christians are those who seek the sympathy of others, and are joined to the church, which is the company of believers, in reality, as well as name.

III. A church organization is *a witness to the world of the truth of the gospel.*

It is a spiritual temple, ‘built upon the foundation of Apostles and Prophets, Jesus Christ him-

self being the corner stone.' And so its very existence bears witness to the truth as it is in Jesus. As Elijah overlooked the scattered thousands who had not bowed to Baal, so there would be danger, were there no central rendezvous for Christians, that their presence in the world would be denied by the unbelieving. The church brings them together in a body; its covenant unites them in one. There they are, to be seen of all. It is no more a question, whether Christ has his followers on earth. They may be numbered. Say not, thou rationalist, that belief in 'the doctrines of the cross' is passing away. Read those 'declarations of faith,' to which so many have given a solemn assent, as the basis of all their hopes. Think not, proud scoffer, that the church is declining. It extends not as we could desire, but it does increase; it divides, and is not weakened; the fathers die, and the prophets do not live for ever, but the children and children's children rise up, and, as of old, the undiminished family surround the table of the Lord. A half century, a century passes, and only in name is the church old. There is no ebbing of vitality; there may be even the renewing of youth. It seems more likely to live on, it promises to bless a larger circuit, than when it first originated; for it draws its being, not from the springs of human life, but from the ~~foundation~~ of vitality in *fountain* Christ. Thus it enshrines and preserves, from age

to age, his life, his truth. Continually it proclaims that his advent has not been in vain ; and, coming to us with a history fragrant with memories of struggles, persecutions, triumphs, adorned with the names of saints now in glory, it confirms, by the simple fact that it still lives, our faith in all the promises of a brighter day.

It is then a blessing for any place, to have a church of Christ gathered in its midst. A community is not in a perfect state, though abounding in wealth and culture, till there exists an organized band of the followers of Christ, pledged to live for him, and helping each other to be faithful. Without this, the truth of God will be despised, children run wild in sin, the public conscience be corrupted, and the commonwealth perish in confusion. The influence of the church is felt by those who never seek its blessings. As the floating ice-berg chills the air and water for miles around, before it is visible to the strongest eye-glass, so does a church, as it were, change the very atmosphere about it, and bless multitudes who cannot see the source of good.

Prompted by such sentiments as to the benefits of entering into covenant with God, the first settlers of this ancient town, in the early part of the year 1630, assembled at Plymouth, in England, and under the guidance of Rev. John White, were or-

ganized into a Church, and received the Rev. John Wareham and Rev. John Maverick as their pastors. They sailed on the 30th of March, O. S., corresponding to our 11th of April, and after a stormy passage of two months, during which they held a daily religious service, were landed at Nantasket. Soon after, a settlement was formed within the present limits of our town, which received its name in grateful commemoration of the piety and services of Mr. White, "the patriarch of Dorchester," as he was often called, who, though he never crossed the ocean, was the active coadjutor of many that came, and exerted an influence in the settlement of New England, second to no other. It is recorded that many of the Dorchester settlers were "men of note and figure," but we honor them, above all, as men of piety, who came to this land as an organized Christian community, bringing pastors with them, and from the first 'avouching the Lord to be their God.' With how many prayers, with what 'strong crying and tears,' from those exiles of Christ, were the foundations of our town laid.

In 1635 and 1636, a majority of the original church, formed in England, removed to Windsor, Connecticut, with Rev. Mr. Wareham, their only pastor; Mr. Maverick having died.

A new church, made up in part of members of the former one, was organized here in August,

1636, and chose as pastor, Rev. Richard Mather, one of the leading ministers of the day, the father of Increase, and grandfather of Cotton Mather, and the principal author of the 'Cambridge Platform of Church Government,' which is regarded as an authority, even to the present time. The covenant of this church (now known as the First Congregational Church in Dorchester) was solemn and simple, and contains not a few expressions which have been adopted in our own.

It is not fitting, on this occasion, to enter in detail on the history of the ancient church from which our organization sprang. Yet we think of it as the spiritual home of our fathers, who held the like precious faith with us, and who transmitted to us the truth and religious privileges we now enjoy. For one hundred and seventy-one years that was the only church in this town, stretching its sheltering wings over those who came from many miles in either direction; a strong and an efficient church, in every generation.

About the year 1805, in consequence of the increasing population, measures were taken with reference to the formation of a Second Church in the south part of the town. The expediency of such a step was generally admitted, and the town was urged to erect a meeting-house, but declined. A company was therefore formed, who purchased a site for the edifice, and on the 7th of August,

1805, a large number of persons assembled on this spot to unite in prayer, before the raising of the building was commenced; and a larger number, six days after, to give thanks that the work had been accomplished with success. Hymns and anthems were also chanted by a choir. So mindful were our fathers, that "except the Lord build the house, they labor in vain that build it."

On the 30th of October, 1806, the edifice having been completed, as the records say, "in a plain, but much approved style," was solemnly dedicated to the service of God. The day was rendered unpleasant by the constant falling of snow, but a large concourse assembled. A band of music performed; and one who was present has recorded, that one of the hymns was sung to a "very gay tune." The Rev. Dr. Harris, then styled "minister of the town," preached from Acts ii. 42: "They continued steadfastly in the Apostles' doctrine and fellowship, and in breaking of bread, and in prayers." Soon after, most of the pews were sold for \$25,730, more than \$10,000 above the cost, which profit was divided among the original shareholders; forming a rare instance where the building of a meeting-house has resulted in gain to those engaged in it.

In June of the succeeding year, (1807,) leave having been given by the town, an act of incorporation for a Second Parish was obtained. On

the 21st of December, (after several preliminary meetings had been held,) sixty-four members were dismissed from the First Church, to be formed into a new organization by an Ecclesiastical Council. The separation was accompanied with many expressions of brotherly love on both sides ; a most fraternal address being presented by those leaving the old church, to which a reply, equally kind in its tone, was returned. An arrangement was made for the equitable division of the income of the personal and real estate of the church. The property itself was divided at a later date, (1818.)

On the 1st of January, 1808, the Council called by those desiring church organization, assembled in this place. Dr. Gray, of Jamaica Plain, offered the introductory prayer ; Dr. Lathrop, of Boston, as Moderator, received the assent of the members to the covenant, and made the constituting prayer ; Dr. Pierce, of Brookline, preached ; Dr. Porter, of Roxbury, presented the right hand of fellowship to Stephen Badlam, Esq., as the representative of the church ; and Dr. Harris concluded the services by prayer and benediction. A large audience was gathered, and the tone of the services was joyous and hopeful ; though some expressions betrayed a suppressed fear that the harmony which had thus far prevailed, might be disturbed. The covenant used on that occasion was modeled after the original covenant of the First Church, and was more

brief than the one we now use, and with a much less definite confession of faith.*

The attention of the church was at once turned to the settlement of a pastor. Several candidates were heard, and during the summer, Rev. John Codman, who had then recently returned from Europe, where he had been pursuing his studies in theology, was invited to preach a preparatory lecture. He struck the key-note of his ministry well, for his text was, "I am not ashamed of the Gospel of Christ." Having also officiated upon two Sabbaths, on the 9th of September, the church, by a unanimous vote, invited him to the pastoral office; and the parish, by a vote nearly unanimous, afterwards concurred.

Before accepting this call, the pastor elect explicitly communicated his views upon doctrinal points, declaring that his "faith in general was conformable to the Assembly's Catechism," and asking that Dr. Watts's Hymns should be substituted for the collection then in use. To this, both church and parish consented; and, on the 6th of November, he gave an affirmative answer to the call.

He was ordained in this place on the 7th of December, 1808, by a Council consisting of twelve pastors of Boston and vicinity, with their delegates. Of these pastors, all but one (the venera-

* The covenant assumed its present form in 1834.

ble Dr. Lowell) have died. The sermon on that occasion was preached by Dr. Channing, from the words: "Be instant in season, out of season." Though printed at the time, and attracting much attention, the author has not given it a place in his collected works. Yet it was a production of rare power and beauty; a plea for ministerial zeal, grounded on the example of Christ—the dangerous circumstances of those whom the preacher addressed—the fact that his own eternal interests are involved in the faithful discharge of his duties—the concern God has expressed for the salvation of men, for which "the Son of God himself left the abodes of glory, and expired a victim on the cross." After the sermon, Dr. Osgood, of Medford, delivered the charge; and Dr. Harris, with characteristic tenderness of feeling, gave the right hand of fellowship.

The young pastor, now in the twenty-seventh year of his age, commenced, in the spirit of the admonitions given at his ordination, his responsible work. His genial warmth of feeling, and simplicity of style, made him a preacher attracting to himself not only the minds of his hearers, but their hearts; and the whole Society felt the presence of a living soul. Not many months, however, had passed, before it became evident that there was a serious difference of opinion in regard to the course he pursued.

I shall not, I need not, enter into the details of

the painful controversy that followed, and continued for more than three years. Let the ashes smoulder undisturbed. I shall only give what seems to me, after reading carefully the statements on both sides, a truthful narrative of those facts, which must be mentioned in a historical sketch of this church. The first formal complaint against the pastor was in a letter sent to him in November, 1809, objecting that he restricted his exchanges to a portion of the ministers of the city and vicinity ; and this fact was, from first to last, the most prominent complaint urged against him.

At that time, as you know, although differences of opinion existed among Congregationalists, the separation of the Orthodox from the Unitarian portion, had not taken place, nor was such a separation generally anticipated. Ministerial exchanges were, on the part of most, made indiscriminately. That policy, it was asserted, the pastor of this church had in private pledged himself to pursue ; but that assertion he always met by an unequivocal and firm denial ; and when the matter was brought before an ecclesiastical council, under the charge that he had uttered falsehood, in making a promise which he did not keep, they pronounced the accusation not sustained.

The controversy continued for two years, before a council was called ; during which time many letters passed from side to side, and many meetings

of the church and society were held. A large majority of the church sustained the pastor, and by formal votes, as well as in more private ways, showed the warmest sympathy. One hundred and eighty-one ladies presented an energetic address, in which they besought their pastor "to bear up against the host of troubles that beset him, like a good soldier of Jesus Christ." And at the same time, not forgetting their dependence on a higher power, they instituted that ladies' weekly prayer meeting, which has continued to this day. The parish were more equally divided; and on one occasion a vote was passed, declaring the connection between the pastor and parish to be extinct.

During all this time, Mr. Codman bore himself with eminent firmness and prudence. The blessing of God attended his preaching, and in the midst of dissension, the church was strengthened by the addition of many converts. At last, after much discussion, a council of twelve churches, six chosen by each side, was called, October 30, 1811, who, after prolonged investigation, dismissed the minor charges, but were equally divided in regard to the main difficulty concerning exchanges. The matter, therefore, still remained unsettled; and another year of even increased discord followed.

On the 12th of May, 1812, a second council assembled, composed of the pastors and delegates

of eight churches, (four selected by each party,) with Rev. Dr. Lathrop, of West Springfield, as moderator and umpire. The direct question was now proposed, whether the pastoral relation should be dissolved; and it was decided in the negative, by the casting vote of the moderator, who accompanied his decision, with a recommendation that the pastor should modify his course respecting exchanges. To some extent this was done; but not so as to satisfy his opponents.

The difficulties now hastened to their crisis, and on the 29th of November, 1812, in accordance with a vote of the parish, the pastor was forbidden entrance to his own pulpit, and another minister placed there, in gross violation of his rights. Nevertheless, he preached as usual, morning and afternoon, though compelled in the forenoon to speak from the floor of the house. The next day it was apparent, that his opponents had gone altogether too far; public sentiment turned against them. Arrangements were therefore soon made, in accordance with which they sold their pews and retired from the parish, to form a new society; thus terminating this unhappy controversy.

Had this been merely a parish conflict, I should not have thought it needful to have given to it more than a passing allusion; but it has a historical importance. It was an event which attracted wide notice at the time, and which led to great

results. This controversy foreshadowed and prepared for the division of the Congregational body into two separate portions. Here it was first openly proclaimed by a church, that the differences of opinion existing between those who had thus far walked together, were too great and fundamental for cordial fellowship, or for consistent ministerial exchanges. We regret that a separation was necessary ; but that it was, we can have no doubt. Better has it been for both parties ; better for the cause of peace and good-will, that those who were not agreed, should not seek to hide their differences by suppressing their honest convictions, but should walk apart. We may still cherish all kindly feelings, and interchange all neighborly acts, with those from whom we have separated, while we declare our conviction, that there is a real and radical difference of belief in respect to the Gospel of Christ.

More pleasant scenes are now before us. From the period which we have now reached, the pastor and a united society labored and prayed together. For many years, no events stand out so prominently as to claim special notice. The truth was faithfully preached to an increasing congregation, and the blessing of God attended it. Although there was no general awakening, which could be termed a revival, till about twenty years after the church was formed, there was a steady growth by

accessions each year. In 1818, the Sabbath school was organized, under the superintendency of the late Deacon Sharp, and from it have since come a large number of the members of the church. In the winter of 1826-27, the gracious effusions of the Spirit were vouchsafed. Never before, or since, has this community been so powerfully aroused. No special means were used, other than more frequent meetings for prayer, in various parts of the parish; but religion became the great topic of conversation and of interest; and as the result, between fifty and sixty were added, by profession, to the church.

The time had now arrived for the church to show its practical belief that "there is that scattereth, and yet increaseth," by sending out a colony to occupy a station by itself. In 1828, a building used as a vestry by this church, was moved to the 'Lower Mills Village,' and formally dedicated as the Village Chapel. In February, 1829, twenty-one members were dismissed, that they might be organized into a separate body, which is now known as the Village Church. This movement proceeded with entire harmony among all concerned. The pastor of this church not only gave it his cheerful approval, but aided, indeed sustained it, by his munificence. For more than a year he paid the whole amount needed for ministerial services, and, to the end of his life, that church, made up of

many very dear to him, shared in his sympathies and benefactions. There was a separation, but no division, when that church was formed.

Again we find the current of affairs flowing on peacefully and uneventfully, for many years. In 1840, there was another season of special religious interest, during which between thirty and forty were received upon profession of their faith; and in 1842, also; on one memorable day in which year, twenty-eight new members, twenty of them young men, were received; the largest number who have ever been admitted at one time. In 1844, a number of members withdrew for the purpose of forming another Orthodox society, which, after continuing for a season, has become extinct.

We now approach the close of the pastor's life. For nearly thirty-nine years, he had labored here devotedly, favored with almost uninterrupted health. To an uncommon degree he loved his work, and was happy with his people. Like Goldsmith's pastor, whom in other respects also he resembled,

“ He ne'er had changed, nor wished to change, his place,”

and, quietly discharging the duties of a “good minister of Jesus Christ,” he stamped the impress of his own character of faith and love, and beheld the church strong, efficient, and united.

In June, 1847, he first perceived the symptoms

of disease. He continued, however, to preach till the 17th of October, when his last sermon was delivered here from the words, "As for me, and my house, we will serve the Lord." Only a few more labors were to be performed. On the 16th of November, he attended the funeral of the oldest member of the church, a patriarch of ninety years, who had been to his pastor a faithful friend, amid the trials of his youth.

On the 5th of December, within two days of the thirty-ninth Anniversary of his Ordination, he entered this church for the last time. Too feeble to ascend the pulpit, he waited below till the time of the Sacrament. Who that was here, can ever forget the scene! Fitly was it ordered, that the Pastor, so affectionate in his disposition, who so delighted in the gathering of the family of Christ around his table, should close his ministry there. With faltering voice he prayed, with trembling hand he broke the bread, and his work was done. He whose first words before this people declared that he was "not ashamed of the gospel of Christ," by his last act testified the same.

Eighteen days followed, of increasing illness and pain, cheered by the attentions of numerous friends and by Christian faith and hope; and then, the tolling bell, breaking on the stillness of a winter's morning, proclaimed that he who so long had been the shepherd of the flock, loving and beloved, had

passed to his rest and his reward. What heart in any of your homes was not sad that day ; what eye refused to weep.

Sable drapery shrouded the house of God—no unmeaning tribute ; families, bowing under a common grief, thronged to their accustomed place ; ministers of the word, in large numbers, came to the burial of their father ; the solemn rites were duly performed ; and dust returned to dust.

Let us linger a moment beside this grave. This church is what it is, owing, under God, to what Dr. Codman was and did. God raised him up for this place. His social position and wealth enabled him to sustain himself and the church, when another, differently situated, would probably have been overcome. His natural courtesy and dignity, his sincere piety, his deep grounded convictions of the truth, his generosity in helping on every Christian enterprise, his skill in judging of men, his quickness and activity of mind ; above all, his genial, overflowing love, gave him a strong hold on the confidence and esteem, and a strong power over the conduct of those with whom he was associated. And the long continuance of his ministry made it especially true, in his case, ‘ as is the pastor, so are the people.’

His life presents a beautiful picture. I see him a young man, enthusiastic, social, flattered by the world ; yet turning away from all its allurements,

and choosing the lot of a minister of Christ; asking, then, not what preaching would be popular, but what most useful; shrinking not from reproach or opposition; bearing himself with prudence and courage, worthy of a veteran. Then, when the strife had passed, giving himself wholly to his work; asking no large emolument, 'seeking not yours, but you;' a friend of all the benevolent operations of the day, a lover of all good men, enjoying in union with one rarely endowed for a help-meet, the fullness of domestic happiness; and at last, after a well-spent life, falling at the altar where he had so long ministered, dying peacefully in his cherished home, and laid to his last repose among his own people. What is wanting to the completeness of such a life?

No one could fill his place; no one sought to. There are pages in the records of this church, there is a spot in your memories, sacred to him alone. On the last day on which he entered this sanctuary, your present pastor came with him, conducted by him to the pulpit door. For three months from that time, I supplied the vacant desk, when, receiving a nearly unanimous call, I gave my assent to it, influenced especially by what seemed to me marked providential indications of my duty.

On the 13th of July, 1848, I was ordained. Nine and a half years have since quickly passed.

They have been uneventful, and yet have wrought many changes. Not a few venerable forms have disappeared from these seats ; one hundred of the congregation have I committed to the grave ; and children, born since I came here, are filling the vacant places.

No general religious awakening has been vouchsafed, but there has been no year without additions both by letter and profession ; and one-third of the present members of the church have been received during this period. The congregation has been large and regular in attendance ; and in 1854, for their better accommodation, this house was remodeled, and assumed its present tasteful and commodious appearance. The relations of the pastor to the officers and members of the church, it becomes me gratefully to acknowledge, have been uninterruptedly harmonious, and your constant kindness has made my work pleasant and light. And so, at the expiration of its first half-century, this church is vigorous and united, still resting upon the same truths which our fathers loved.

From the beginning to the present time, eight hundred and fifty-three individuals have been connected with it, two hundred and ninety-two being received by letter, and five hundred and sixty-one, or nearly two-thirds of the whole, by profession. Of these, about two hundred and seventy have been

dismissed to other churches, and about two hundred and fifty-five have died in its membership ; leaving, after we deduct those suspended and excluded, three hundred and six as the present number of communicants. The office of deacon has been filled by twelve of the brethren, of whom seven have fallen asleep, 'having obtained a good degree,' and four now bear office. Eleven of its members have entered the ministry, and others are looking forward to the same work.* Would that we had also sent forth some missionary of the cross to foreign shores.

But these figures and numbers are cold. They do not represent the real working and influence of the church. Its lines stretch out unseen, marked only by the eye of God. To know what this church has effected during the fifty years of its existence, we must know the spiritual history of the thousands, members of three different generations, or four, who have gathered within these walls ; we must know the influence of its eight hundred and fifty members, each one of whom has communicated, by the fireside, in the walks of

* It seems fitting that these pages should preserve the names of those, to whom this church is thus indebted, or by whose usefulness it has been honored. The Deacons who have died, are Stephen Badlam, Ebenezer Withington, Joseph Clap, William Hitchings, Samuel Capen, Isaac Howe, and Edward Sharp. Those members who have entered the ministry, are Leonard Withington, D. D., Calvin White, John Wild, Otis Holmes, William M. Rogers, Foster Thayer, Richard Tolman, Uriah Balkam, George Leeds, Andrew B. Foster, and Lyman Cutler.

business, in society, the impulses here received, and some of whom have gone forth to far distant lands ; we must follow the eight hundred baptized children of this church, many of whom have been received to other communions, in all their wanderings ; we must look into the homes this church has overshadowed, and upon the graves it has blessed ; we must learn the effect of all the prayers that have been offered here, some of which have been answered, and others are still as “ a memorial before God ;” we must know what impressions its simple existence here, as a monument blazoned with divine truth, pointing heavenward, and ringing out its Sabbath peal, has made upon the passing throng ; we must follow, to their eternal rest and glory, all those who, year after year, have passed from our fellowship to the church on high. No historical review can take up such particulars as these ; and yet, until they are included, how imperfect the survey.

And now, beloved friends, in the retrospect of the past, *are we not called to express our thankfulness to God ?* I would avoid all empty boasting ; I know that we have come far short of being a pure or perfect church ; but certainly this has been a church highly favored. Viewing the struggle of its early years as a conflict for the truth, which God overruled for good, we cannot regret it now ;

and it has given this church and its first pastor an honorable place in the religious annals of New England.

Then you have always respected the independence of the pulpit, and the proper dignity of the ministerial office. There is much said, in these days—often unjustly, I think—to the effect that ministers are afraid to speak out their honest convictions. Your pastors have never known such a fear; they have been sure you would confess their right to utter whatever duty seemed to require.

This has been, also, a praying church. In seasons of trial, its early members learned the need and the power of prayer. Praying women have, from the first, been its bulwark of strength, and are so now. Its special and annual days of fasting and supplication have been always observed with deep interest and fervor. A conviction of dependence on God is often and emphatically confessed among us.

A spirit of beneficence may be mentioned, as another characteristic. There has been a readiness to respond generously to every appeal. For forty years you had before you a noble example of large-hearted liberality; and not in vain. The total amount of your contributions, I know not; but I can say that every prominent object of Christian enterprise has received a steady and generous support. You have not needed to be urged;

my experience has taught me that a hint is better than an exhortation.

More than all, the life-giving presence of God has been with this church from the first. Its growth has been, in general, from the effects quietly and steadily following the regular means of grace. There have been but three years, out of the fifty, when any general awakening has been enjoyed; but, on the other hand, only two years in which there have not been some new converts received. God has thus been ever present, even until now, bearing witness to his truth. I mention these things, not to encourage self-satisfaction, only to testify to the goodness of God. We dare not boast, lest we turn our glory into shame; but we must magnify and praise Him, by whose grace we have been sustained.

Finally, dear brethren, *consider your responsibility*. Successors of a long line of godly men, exiles and pilgrims for the truth's sake; entering into the labors of those of a later age, who have struggled for what they believed the pure doctrine of Christ; inheritors of all the blessings that now, for half a century, God has poured upon this spot, of the bright examples, the toils, the prayers, the hopes of the pious dead; are ye not called, to-day, to renew your covenant, and henceforth so to live, that this church, now honored, and may we not

say, venerable, shall have before it a future, even brighter than the past?

By the solemnity of our vows; by the power there is in united, sympathizing action; by the mission of the church to bear the life-giving truth to those perishing in unbelief and guilt—are we not bound to seek an increasing development of life and power? To sit here, where so many have been born to God, unreconciled to him; even to be here with such responsibilities, and only mindful of our own safety, is surely to provoke swift-coming judgments.

As to-day, then, we set up our memorial, saying, “Hitherto hath the Lord helped us,” we draw from the past no warrant for presumption; only courage to trust God for the years to come, and incentives to fidelity. Precious and sacred is our charge. We have received it from hands now mouldering back to dust, and unborn generations expect it in their turn.

In other lands, you may stand beneath the lofty arches of cathedrals, which have echoed with the praises of God for near a thousand years, while you press the dust of those who also worshiped there, before ever a white man’s foot trod these shores. Then you feel how enduring is the life of the church.

We cannot here boast such a past; but we may have a future even more prolonged. I love to

think of this church as abiding here until the end of time. By the title-deed of the ground beneath us, it is secured for ever (so far as such deeds have power) for a sacred use. Why may not Christ be worshiped on this spot, till he shall appear in glory? This building must fall; but the church, which is Christ's body, cannot be so destroyed. The half-century gone by, may be but the first period of its infancy. With what trembling solicitude, then, should we guard its divine life?

We are not alone in our care. Spirits of the just made perfect, may still watch the place of their heavenly birth. Angels, ministering to the heirs of salvation, have learned the way hither. And God, the Father, the Son, and the Holy Spirit, with ceaseless love, remembereth those who confess his name, and trust his grace.

THE LORD OUR GOD BE WITH US, AS HE WAS WITH
OUR FATHERS.

Results of Experiments on Contact Resistance. By Professor W. A. Norton.—*American Journal of Science and Arts.*

The Mechanics of Ventilation. I. By Geo. W. Rafter, C. E.

The Position and Prospects of the British Iron Trade. Explosion of Steam Boilers. By John W. Hill, M. E. On the Bottom Velocity and the Velocity Scale of Rivers. By J. Schlichting.

Mr. C. D. Marr on Marine Engines; Draining of the Zuyder Zee.

Reports of Engineering Societies.

How Siemens Steel is Made; Danks Iron; Manufacture of Slag Wool.

Rarchaert's Total Adherence Locomotive; Continuous Railway Brakes.

The Bridge of the New Cincinnati Southern R. R., over the Kentucky River; The Hudson River Tunnel; The Channel Tunnel; The Wrought Iron Bridge Co., of Canton, Ohio.

Mr. Brassey on Gunboats.

Power of Electric Light; Defences of Victoria; Davy's New Metal.

The present widely extended interest in hydraulic and sanitary science, is plainly evidenced by the many inquiries we have respecting Fanning's elaborate treatise on *Hydraulic and Water-Supply Engineering*, recently issued by us. These inquiries come not only from hydraulic engineers, and commissioners of public water supplies, but from railroad engineers, persons interested in sanitary science and improvements, manufacturers and others interested in water powers, instructors, and from technological students.

We have thought it advisable to give in this number of the RECORD (pages 31 to 38 inclusive) a list of the chapter headings and of the tables. We may remark, however, that the chapter headings do but merely indicate the line of discussion of the general subjects of the three main divisions of the work, and not the fullness of treatment of each successive detail, or the thoroughness of research which has made possible a treatise, at once full, clear, and concise. The list of the tables which are interspersed throughout the work, will indicate more fully the mass of statistics which have been gathered as incident to the subjects, and the useful portions of the same that have been tabulated for convenient practical use. We append to the list a few brief extracts from press notices, showing the favor with which the work is received both here and abroad.

On page 40 of this issue of the RECORD will be found title page and contents of a new work on the "Determination of Rocks," which forms an introduction to the more advanced treatises on Lithology. It is a work which has been needed for some years, for there is no other book in the English language giving specific directions for the

practical examination and classification of rocks. Up to the present time the student who reads English only had no means of knowing how to name such rocks as he met, even although he had read the few text books on this subject attentively. The time is soon coming when a report of a topographical survey, for any purpose, will be considered incomplete if the lithology of the district be not accurately described. The last volume of the government report of the great survey west of the 100th meridian, is devoted entirely to the rocks of that region, but the average student will find it a difficult task to understand if his previous knowledge of the subject has been derived from English works only. To prepare the way for a wider knowledge of this growing subject by presenting in a practical way the rudiments, is the object of Prof. Plympton's little book. A knowledge of the proper use of the blowpipe; enough skill in weighing to determine specific gravity; and the simplest possible experimental tests in qualitative analysis, are the chief acquirements called for in the beginner.

The Egyptian General Staff has commenced a series of publications relating to explorations in the remote provinces of Egypt. Of these Part I (1874) has already appeared, being a summary of Letters and Reports of his Excellency, the Governor General of the Provinces of the Equator. It is a well printed octavo pamphlet of 90 pages with Maps and Views. A Report on the Provinces of Karlofan will soon follow, and others are in due course.

The following papers of "The Institution of Civil Engineers" London, have recently been printed.

Stooke on the "Whiston Pumping Station, St. Helen's, Lancashire."

Baldwin on "Tunnel Constructions."

Soulter on "Street Tramways."

Armstrong on "Water Pressure Machinery."

Haycraft on "Manufacturing Charcoal for Gunpowder."

Colonel Geo. T. Balch for many years an officer of the Ordnance Department, U. S. Army, and who for the past two years has been engaged in superintending the compilation of the very complete Inventory of the estate of the Erie Railway Company under its present Receivership, has just published a work of permanent value to Railway officers and students of railway organization and administration, entitled, "A General Classification of Railway Rights, Realities and Personalities, designed to facilitate the work of taking an accurate Inventory of such property." No classification of Railway property has ever before appeared in

print, except a 40 page pamphlet by the same author, a few copies of which were issued in August, 1875, as an aid for the officers engaged in describing the Erie property. The present edition is a handsome folio of 75 pages, embracing the indices used in the copy of the Inventory in 19 volumes folio prepared for the Supreme Court of New York.

A brief account of the circumstances which led to the preparation of this classification, and of the origin, progress and use of the inventory work of which it forms a part, is given in the preface. This work is only the precursor of the very comprehensive and voluminous one on which Col. Balch has long been engaged, namely, "A system of Bank Forms designed for Inventorying and Inspecting Railway Property." That portion of the text relating to Railroad Real Estate, embracing 142 separate forms, one set making 900 pages folio, will be ready early in January next. It is expected that the entire system comprising 360 forms, each having printed on it elaborate instructions for its use, will be completed in about a year. The price of the present work is \$5.00.

The fifth part of Geo. E. Woodward's Alphabets and Monograms has appeared. The work will be completed in 20 Parts. It is finely printed on heavy paper quarto size. Price is 50 cents per part.

The *Commercial Advertiser* of Sept. 19th, speaks of Shield's little work on "Engineering Constructions" as follows:

A technical book of great value from the mass of information contained in a compact and accessible form is "Engineering Construction," just issued by J. E. Shields, C.E., from the press of Van Nostrand. The book, which is only of 138 pages, is divided into four departments, "Foundations," "Masonry," "Tunnels," and "Engineering Geodesy." The object of the author is simply to direct attention to the true principles of construction as declared by the highest authorities, and tested by his own experience in a professional practice of many years. To the non-professional reader this work is not without interest, since it imparts information and describes many methods which do not require an engineer's education to make use of at times. But it is strictly a professional work.

Among the books of tables before the public, a little work by W. H. Noble, is not in as general use, as its merits and cheapness, as well as compactness, would seem to warrant. It contains considerable as will be seen by the following summary of contents:

Metric Measures of Weights—

For converting grammes into drams avoirdupois.
 " " grammes into grains troy and vice versa.

For converting kilogrammes into pounds avoirdupois.

For converting drams into grammes.

" " pounds " kilogrammes.

" " drams avoirdupois into grains troy.

Ounces and drams to decimals of a pound avoirdupois, or drams to decimals of an ounce.

Pounds avoirdupois to tons and vice versa.

For converting millimetres into inches.

" " metres into feet.

" " " to yards.

" " cubic centimetres to cubic inches.

" " " metres to cubic yards.

" " inches into millimetres.

" " feet to metres.

" " yards to metres.

Cubic inches into cubic centimetres.

" yards to cubic metres.

Littres to pints and vice versa.

Table for converting atmospheres into tons, and vice versa.

Table of tons converted into atmospheres taken at 760 M M (29.92 inches) of mercury = 14-7 lbs per square inch = 152-381 atmospheres per ton.

For converting tons per square inch into kilogrammes per square centimetre, and vice versa.

Comparison of the scales of Fahrenheit's, the Centigrade and Réaumur's Thermometers.

Table of Natural Sines, Tangents, Secants and Logarithms.

Table of Four Figure Logarithms.

Problems in " "

Probable Rectangles.

Table of dimensions of Probable Rectangles.

The whole forms a dainty, square little book, fitting nicely in the pocket, clearly printed on good paper, and bound in limp cloth covers. The price is but 50 cents.

The following review of Mott's "Chemist's Manual" appears in the *London Mining Journal* of June 23d:

That one's private note-book frequently contains facts of greater utility than anything to be found in the most carefully arranged text-book, because it is intentionally adapted to one especial object and nothing else, has long been acknowledged, and it is upon this consideration such works is that of Dr. Henry A. Mott, Jr., will certainly have a very favourable reception among those for whom it is intended. In recommendation of the work, Prof. Chandler, Dean of Faculty, of the Columbia College School of Mines, very truly remarks that the literature of analytical chemistry in the various branches of qualitative, quantitative, blow-pipe, and technical analysis, and assaying, has expanded to such a degree as to make it impossible for students and even for most professional chemists to possess a complete library in these branches of science: moreover, much of the literature is sealed to many chemists by being published in French or German, or in Journals or trans-

actions of Societies which are inaccessible. A further embarrassment arises from the multiplicity of methods given in special works from which few can select without first testing several. Dr. Mott has carefully selected those methods which work best and are most reliable in the hands of the general manipulator, and thus assists him to secure the results he is seeking—his book is, in fact, an intelligent student's note-book systematised and perfected into a book of reference.

Tables of the Elements and of Specific Heat, of course, occupy the first place, and the section on Qualitative Analysis includes an account of the deportment of the metals and their salts with reagents; scheme for qualitative analysis, detection of acids, table of analytical chemistry, Zettnow's scheme for qualitative analysis, reactions of fat oils, tests for impurities in pharmacopœial preparations, and of the influence of organic substances on the precipitation of metallic oxides. Zettnow's scheme, which renders sulphuretted hydrogen and sulphide of ammonium unnecessary, and Stas-Otto's scheme for the Detection of Alkaloids, are particularly interesting, although the former is not likely, one would think, to supplant Fresenius's scheme when the sulphuretted hydrogen and sulphide of ammonium are within reach.

The methods for the detection and separation of alkaloids described by Trapp in the *Jahresbericht* and in the *Vierteljahresschrift für Prak. Pharm.*, are carefully given. Attfield's Table of Tests for Impurities in Pharmacopœial Preparations is reprinted; as is also, with very slight alterations, Egleston's scheme for the qualitative determination of substances by the blow-pipe, and Cornwall's method for the determination of bismuth in the presence of lead and antimony, both of which have been published in the *Mining Journal*. There are elaborate tables of specific gravities, the Mineralogical notes include only the principal of those which have been usefully applied in the arts, so that all the information usually required is compressed into a very small space. With regard to the diamond, Dr. Mott remarks that as it is very difficult to distinguish it from some closely allied stones, it is better not to trust to the judgment alone, though some jewellers think they can detect the diamond with ease; he, therefore, inserts Prof. Egleston's table for the determination by scientific means. The diamond has a density of 3.52–3.55, simple refraction, the index of refraction being 2.455 (which really distinguishes it from all other stones), and the electricity is positive but not durable. Ruby, sapphire, and oriental amethyst have—density, 3.9–4.3; refraction, double \times axis; index of refraction, 1.765; electricity last several hours. The corresponding particulars for chrysoberyl are 3.5–3.8; double 1.760; lasts several hours. White topaz, which has often been mistaken for diamond—indeed, there are some who doubt whether the so-called Portuguese diamond of 148 carats is not merely a white topaz—has density, 3.4–3.6; refraction, double 2 axes; index of refraction, 1.635; and retains electricity for more than 24 hours. For chrysolite the details are—density, 3.3–3.5; refraction, double; index, 1.660; electricity, positive; emerald—density, 2.6–2.8; refraction, double \times axis; index, 1.585; electricity, positive; spinal, 3.4–3.8; simple, 1.755, and not tried; zircon, 4.4–4.6; double, 1 axis, 1.990; and positive not durable. Quartz corresponds in almost every particular with emerald, though differing in hardness and color, having—density, 2.6–2.8; refraction, double 1 axis; index, 1.549; electricity positive, not durable; and strass is of variable density, usually about 3.5; simple refraction; its electricity being variable and not durable.

With regard to stoichiometric calculations, the examples are taken from Barker, whence also it should have been mentioned the admirable table of the nature of molecules is also quoted and acknowledged. Then follows a chapter of schemes for the quantitative analysis of the most frequently occurring compounds, embracing not only the ordinary ores and minerals, but urine, blood, milk, and sugar. Descriptions are given of the methods of assaying iron ore, gold, and silver, lead, antimony, and platinum; a section on the Chemistry of Man; and about 100 pages of miscellaneous information concluding the volume.

Both to students and practical men Dr. Mott's manual will prove of the utmost possible value, since by bringing together in a compact and readily accessible form all the information usually required, it will be a very satisfactory substitute for quite an extensive reference library on the subjects dealt with.

The following review of "Douglass and Prescott's Chemical Analysis" appeared in the *Chemical News*, (London) for June 15th, 1877.

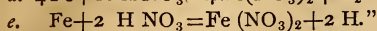
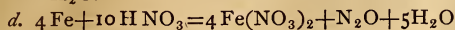
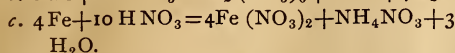
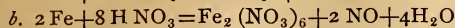
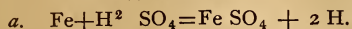
This book is in reality, as its second title affirms, a guide in the practical study of chemistry and in the work of analysis. It is not a mere body of directions to be blindly followed by the student without his having learnt the reason why. If this book be faithfully studied, the habits of "automatic operation" and "superficial observation"—too often the only acquirements learnt in a laboratory—will be accompanied by a sound knowledge of the principles on which the plans of qualitative analysis are based. Indeed, if we had before us for review nothing but one more mere manual of analysis, distinguished from the ever-increasing crowd of such manuals, to which the attention of teachers and learners is being continually called, by no distinctive superiority, we doubt whether our readers would have thanked us for noticing the book. But the volume before us shows so many marks of ability in its conception, and care in its execution, that it is a real pleasure to speak decisively in its favor.

In criticising a volume on chemical analysis the minutest details of the treatment adopted would be out of place. But we may give our readers a summary of the contents of the book, and we may also convey some notion of the style in which the subject is handled in a very few lines.

After a few preliminary remarks, very sound and intelligible, on the study of chemical analysis, we reach the two chief chapters of the book, relating to the reactions of the metals and acids, respectively. Here the rarer metals and non-metals are introduced, but the rarer organic acids are excluded as not admitting of adequate discussion in a manual for students' use. Indeed, if we include such organic acids as succinic and salicylic in a handbook of ordinary qualitative analysis, such organic bases as methyamine and quinine can scarcely be omitted. Nearly two hundred pages are thus occupied with what may be called the comparative chemistry of the metals and bases of the non-metals and acids. There is no shirking of explanations. Reactions are duly displayed, while a running commentary explains at once why certain properties and changes are utilized in the processes of separation, and, also, how this is done. That the reactions are chronicled with adequate fullness may be gathered from a single example which we take, haphazard, from the account of iron compounds, which occupies more than five pages, (47 to 52):—

"Iron dissolves in hydrochloric acid and in dilute sulphuric acid, to ferrous salts, with liberation of hydrogen

(a); in moderately dilute nitric acid, with heat, to ferric nitrate, liberating chiefly nitrate oxide (b); in cold dilute nitric acid, forming ferrous nitrate with production of ammonium nitrate (c), of nitrous oxide (d), or of hydrogen (e):—



After the foregoing reactions and plans of separation, we find a concise account of the "Preliminary Examination," including blow-pipe analysis; then follows the systematic analysis of solutions, and a full account of the solubilities of salts. The two pages (245-6) devoted to Reagents do not suffice for a useful discussion of this subject.

General T. F. Rodenbough's work, "From Everglades to Cañon with the Second Dragoons,"

was noticed in *The Magazine of American History*, for February, as follows:

"A Comprehensive Memoir de Service," as the author, who was a Captain in the Second Cavalry, terms in his preface this extended account of his long connection with the Army. It includes personal recollections chronically arranged; contributed by General Cook, Colonel Lee, Majors Thompson and Davis; an account of operations of the Cavalry of the Army of the Potomac in 1863; the experience of Colonels Leoser and Harrison and Major Smith, under Sheridan in the famous campaign of 1864, and a description by Lieutenant Doane of the exploration of the great Yellow Stone National Park, by his regiment; to these are added, Letters of a Subaltern by a young officer of the Second Cavalry; a Trumpeter's Notes, by no means the least interesting of the series; and a Roll of Honor, in which the extraordinary "faits d'armes" of enlisted men are recorded. In the preparation of this Volume, the archives of the war department have been freely opened to the writer, and if our opinion be worth anything, we should say that technical accuracy of statement, purely military and amusing details of general interest are happily blended.

LIST OF BOOKS PUBLISHED SINCE OUR LAST ISSUE.

- Balch.** (Lt.-Col. G. T., C.E., late of Ordnance Dept., U.S.A.) A General Classification of Railway Rights, Realities and Personalities. Designed to facilitate the taking of an actual inventory of such property. Folio, 75 pp. Paper...\$ 5 00
- Chabirand, (G.) Brault, (L.)** Traite d'Astronomie et de Meteorologie appliquees a la Navigation, Tome Premier, Astronomie. Par G. Chabirand. 8vo, paper. Paris, 1877..... 4 00
- Christiani, (R. S.)** A Comprehensive Treatise on Perfumery. Containing a History of Perfumes, a Complete Description of the Raw Materials, and Apparatus used in the Perfumer's Art. 8vo, cloth, illustrated. Phila., 1877..... 5 00
- Dupont & Auberville, (M.)** Ornamental Textile Fabrics of all Ages and Nations. A Practical Collection of Specimens. 50 plates in gold and Silver Colors, comprising upwards of 1000 Various Styles of Ancient, Mediaeval, and Modern Ornamental Designs of Textile Fabrics, with Explanatory Descriptions, and a General Introduction. One vol., folio, cloth, gilt, extra..... 40 00
- Hellyer, (S. S.)** The Plumber, and Sanitary Houses. A Practical Treatise on the Principles of Internal Plumbing Work; or, the Best Means for Effectually Excluding Noxious Gases from our Houses. 8vo, cloth, illustrated. London, 1877..... 3 50
- Hildenbrand, (W.)** Cable Making for Suspension Bridges, with especial reference to the Cables of the East River Bridge, 16mo, boards. New York, 1877..... 50
(Van Nostrand's Science Series.)
- Jannettaz, (E.)** A Guide to the Determinations of Rocks, being an introduction to Lithology. Translated from the French by Prof. G. W. Plympton. 12mo, cloth. New York, 1877.... 2 00
- Kempe, (B. A.)** How to Draw a Straight Line. A Lecture on Linkages. 12mo, cloth, with numerous illustrations. "Nature Series."..... 50
- Latham, (B.)** Sanitary Engineering. A Guide to the Construction of Works of Sewerage and House Drainage, with Tables for facilitating the Calculations of the Engineer; to which is added an appendix, giving Specimen Copy of Proposals for Estimates and Specifications for the Construction of a Sewer in New York City; also, a Paper on the Planning and Building of Sewers, translated expressly for this work. Small folio; many plates. Chicago, 1877.....\$ 3 00
- Mault, (A.)** Natural Geometry. An Introduction to the Logical Study of Mathematics. 12mo, cloth. London, 1877..... 50
- Mayer, (A. M. Prof.) Barnard, (Chas.)** Light: A Series of Simple, Entertaining and Inexpensive Experiments in the Phenomena of Light, for the use of Students of every Age. 12mo, cloth. New York, 1877..... 1 00
- Perreux, (L. G.)** Lois de l'Univers; Principes de la Creation. 2 vols, 8vo. Paris, 1877..... 6 40
- Perry, (Ed.)** Modern Observations on Rifle Shooting, with an Improved System of Score Book. 12mo, tucks. New York, 1877..... 1 00
- Potter, (Thos.)** Concrete: Its use in Building, and the Construction of Concrete Walls, Floors, etc., with illustrations. 12mo, cloth. London, 1877..... 1 75
- Report of the Proceedings before a Committee of the House of Commons on the Crystal Palace District Gas, and the Gas Light and Coke Company's Bills.** Sulphur Compounds in Gas. 8vo, cloth, London, 1877..... 2 50
- Roscoe, (H. E.) & Schorlemmer, (C.)** A Treatise on Chemistry. Volume 1. The Non-metallic Elements. With illustrations, and a portrait of Dalton. 8vo, cloth. London, 1877..... 10 50
- Tramways.** Report from the Select Committee on Tramways—(use of mechanical power)—together with the Proceedings of the Committee, Minutes of Evidence, &c. Folio paper. London, 1877..... 1 50

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CABLE-MAKING FOR SUSPENSION BRIDGES,

WITH SPECIAL REFERENCE TO THE

CABLES OF THE EAST RIVER BRIDGE.

BY

WILHELM HILDENBRAND, C. E.



PREFACE.

THE following treatise was originally written for *Van Nostrand's Eclectic Engineering Magazine*, and published in a series of articles. It contains in general a description of the manufacture of wire cables, after the method invented and patented by the late John A. Roebling, and followed by him and his son, Col. W. A. Roebling, in the construction of the largest suspension bridges of this country. It also includes such theoretical investigations as pertain to an exact regulation of a cable, or chain, which may be found convenient in practice. The data of these calculations, as well as the diagrams of the apparatus and the description of the method of working, are taken from the East River Bridge, which, by its magnitude and present erection, is a fit example. In view of the fact that the method of cable-making described is comparatively new and not generally known, and that great interest has been manifested by American and foreign engineers in the construction of the East River Bridge, and particularly of the cables, it is hoped, that the following pages, if they succeed in contributing something to the information of those interested in the subject, will not be unfavorably received.

W. HILDENBRAND.

New York, Sept. 1st, 1877.

* * * Copies sent by mail on receipt of price.

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A

PRACTICAL TREATISE

ON

WATER-SUPPLY ENGINEERING:

RELATING TO THE

HYDROLOGY, HYDRODYNAMICS, AND PRACTICAL
CONSTRUCTION OF WATER-WORKS, IN
NORTH AMERICA.

WITH NUMEROUS

TABLES AND ILLUSTRATIONS,

BY

J. T. FANNING, C. E.,

MEMBER OF THE AMERICAN SOCIETY OF CIVIL ENGINEERS.

NEW YORK:

D. VAN NOSTRAND, PUBLISHER,

23 MURRAY STREET & 27 WARREN STREET.

1877.

WATER SUPPLY ENGINEERING.

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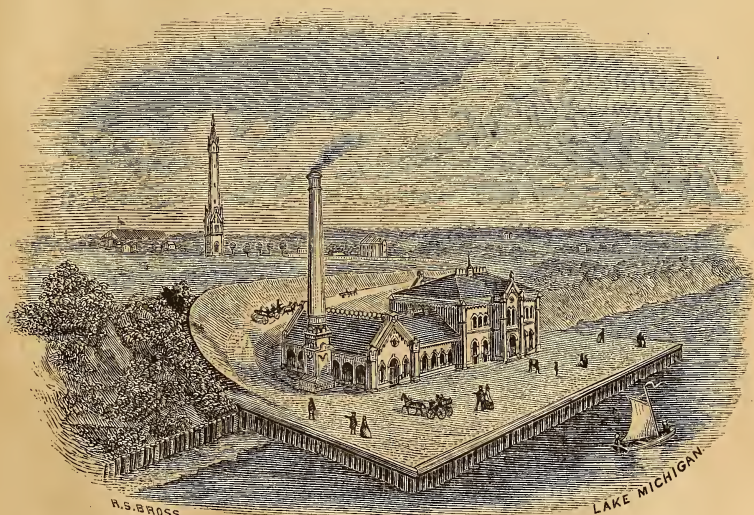
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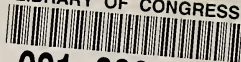
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